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NOVEMBER 1965
VOL. 31 NO. 4

Soil Conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

DOCUMENTS

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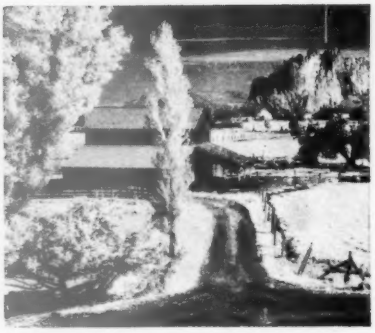
SOIL CONSERVATION SERVICE U. S. DEPARTMENT OF AGRICULTURE



Soil . . .

Seeking new knowledge about soils to make surveys more useful to more people is the job of a little known group of SCS scientists. Deputy Administrator Charles Kellogg arranged for Researcher Joe Kubota to report on significant studies of the relation of trace elements to animal nutrition (p. 77). The link between the mineral content of soils and livestock health in certain areas reconfirms the view of soil as the foundation of the pyramid of life.

Esthetics: The contributed article on soils in relation to planning landscape beauty by Cornell Professor Gerald Olson and New York State Soil Scientist Raymond Marshall (p. 84) underscores the new interests in soil surveys arising out of new concerns in land use.

Recreation: NACD's national inventory of outdoor recreation resources and facilities no doubt will require help from many SCS fieldmen. To explain what it's all about, Recreation Specialist Frank Edminster prepared our lead article (p. 75) about the purposes and rationale of the survey.

This survey promises to provide the first really thorough accounting, district by district, of both private and public recreation resources and needs. The findings need then to be translated realistically into the State recreation plans being prepared under the auspices of the Bureau of Outdoor Recreation.

COVER: An infra-red photo of an autumn ranch scene in the Midstate Soil Conservation District, Oregon, captures the kind of appeal to vacationers that can be counted in the recreation resources inventory.

Soil Conservation

Devoted to the wise use of land and water resources

NOVEMBER 1965 **VOL. 31, NO. 4**

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Recreation potentials, used and unused, will be evaluated in each conservation district.

Recreation Inventory

Conservation districts enumerate existing facilities, estimate potentials for new ones

By Frank C. Edminster
Resource Development Division, SCS, Washington, D. C.

SOIL and water conservation districts in 42 States and Puerto Rico are cooperating in a national inventory of private and public outdoor recreation areas and facilities.

The project is under leadership of the Recreation and Wildlife Committee of the National Association of Soil and Water Conservation Districts. Inventory data are expected to be complete and available early in 1966.

The effort is aimed at providing the first comprehensive summary of outdoor recreation resources in the Nation that includes a thorough inventory of privately owned facilities. It will enumerate all known existing facilities and will help to estimate potential developments from available information. The results will enable soil conservation districts to better extend their long-range programs to include recreation developments.

Local and regional data

State soil conservation committees, assisted by State recreation planning agencies and the Soil Conservation Service are expected to combine individual district inventory data to obtain State totals. These in turn will be summarized by regions and nationally.

Meanwhile, the Bureau of Outdoor Recreation is making a survey of public and private outdoor recreation areas based on a sampling procedure designed to provide data of regional and national scope. Information from this study will be used in a nationwide outdoor recreation plan due in 1967.

Recreation planning has advanced rapidly since release of the Outdoor Recreation Resources Review Committee (ORRRC) Report of studies that were completed in 1962. Plans for meeting future recreation needs are being pushed as fast as personnel and procedures allow.

Of wide general interest is the development of comprehensive statewide plans by States, spurred by opportunities and requirements of the new Land and Water Conservation Fund Act. Program planning for outdoor recreation by soil and water conservation districts has progressed well in most sections of the country.

The NACD Committee early recognized the need for standardization of procedures for recreation planning. Because of the nature of the outdoor recreation business with its highly mobile clientele, the ability to correlate local plans and to add them up for the purpose of broader planning is critical.

Steps in planning

Program planning for meeting recreation needs requires four steps or parts:

(1) An analysis of the existing situation—recreation areas and enterprises now developed to meet the current needs.

(2) An appraisal of resources not yet developed or only partly developed.

(3) An analysis of the prospective needs (market demand).

(4) A program to meet these needs.

The current inventory will have

accurate data on what kinds of recreation are now available, in what quantities, with what facilities, and where they are located. Soil conservation districts and others will know which areas are publicly owned, which are quasi-public or nonprofit group areas, and which are privately owned and operated for public use.

Once the present situation is known, we then need to determine the potentials for future expansion. This is the second step which involves an appraisal of resources that are now either undeveloped for recreation use or underdeveloped. This process not only concerns the full gamut of natural resources, but it also must consider human populations and certain aspects of the transportation system and of land ownership.

Judging resources

Appraisal of resources is more difficult than enumerating existing developments. Certain aspects lend themselves to quantitative analysis but many do not. Hence group judgment by qualified people is strongly involved. Further, the appraisal must be made separately for each kind of recreation area because "recreation" is too complex to be analyzed as a whole.

The number of kinds of recreation possibilities that need to be surveyed will vary from district to district. For convenience, 12 kinds are used in the NACD inventory of private enterprises. In an individual district, one or more of these may not be significant; or, one or more others may need to be added. They are: (1) Vacation cabins, cottages, and homes; (2) camp grounds; (3) field sports areas; (4) fishing waters; (5) golf courses; (6) hunting areas; (7) natural, scenic, and historic areas; (8) riding stables; (9) shooting preserves; (10) vacation farms and guest ranches; (11) water sports areas; and (12) winter sports areas.

Many of these have two or more variations. For example, campgrounds may offer vacation site camping with tents or trailers, transient camping, or pack camping. Sometimes a real estate subdivision may deserve separate appraisal as a type of recreation area.

Each type of recreation area has a potential for development that depends on a number of things—elements of resources, human populations, etc. The most common elements that require consideration are the following: (1) Climate, (2) scenery, (3) natural areas, (4) historic areas, (5) soils, (6) existing water areas, (7) water impoundment sites, (8) wildlife habitat (including fish), (9) wildlife populations (including fish), (10) human population—size and distribution, (11) population—demographic characteristics, (12) population—income level, (13) proximity to cities, (14) highways and access roads, and (15) rural ownership characteristics.

A matter of judgment

The significance of each of these elements must be appraised for each kind of recreation. Factual information and statistics will be available for each, but in the end a judgment is required. For example, the climate in a given area may be described in terms of the annual rainfall and its distribution, mean and extreme temperatures, number of sunny days, dependability of snow cover, wind directions and intensities, relative humidity, and the like. But each of these—and the total climate—must be *interpreted* in relation to each kind of recreation area. This interpretation may be in relative rather than absolute terms.

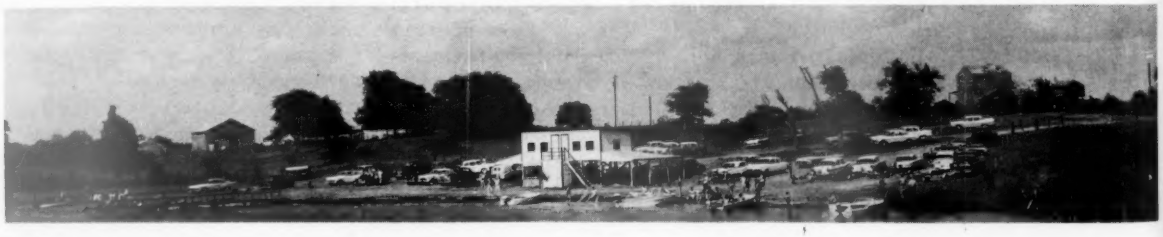
To illustrate, the summer climate in a certain conservation district may be quite favorable for vacation cottage areas in relation to the summer climate in several cities located 50 to 300 miles away. Although its climate may be far from ideal in absolute terms—by no means comparable to that in the Adirondack Mountains or the Grand Tetons—it would still be rated very good *in relation* to the climate where the customers live.

In the case cited, a group judgment appraising the climate in the district (or in various parts of it) would be needed despite the fact that abundant statistics are available. These data cannot be manipulated mathematically to get an answer; they can only be used as information to help reach a dependable judgment. However, it is desirable to have a procedure for this judgment-making process that can be used in many areas and lead to consistent, comparable results. For that reason, a scoring system will be used in appraising resource potentials for outdoor recreation.

The net result of the resource

(*Continued on p. 91*)

Small private recreation facilities will be counted as well as the larger public and community developments.



Soils and Animal Nutrition

Scientists study problem areas where trace elements affect livestock health

By Joe Kubota
Research Soil Scientist, SCS, Ithaca, N.Y.

SOME soils present problems to livestock growers because they contain too little or too much of certain trace elements that affect the nutrition of grazing animals that feed on the forage they grow.

To identify these soils and determine their distribution throughout the country so that soil maps can be made more useful to landowners is the aim of studies by a group of Soil Conservation Service soil scientists working with researchers of the Plant, Soil, and Nutrition Laboratory of the Agricultural Research Service at Ithaca, N.Y.

The two agencies are cooperating in studies that link soils, plants, and anmials to explain problems of mineral deficiencies and toxicities in livestock.

By relating the results of investigations of selected test sites to kinds of soil, the researchers have been able to give direct suggestions to farmers and ranchers about potential grazing problems. The studies combine knowledge of soils with findings about the nutrition of plants and animals to make useful interpretations of soil maps regarding the use of land for grazing.

Study results have shown that vigorously growing forage plants on some soils may be of doubtful nutritional quality because of inadequacies or imbalances of certain micronutrients. This is especially true where the micronutrient requirements of the plant differ from those of the animal.

The cobalt problem is one example. Animals require more cobalt than do most plants. Legumes need cobalt, but grasses have not been shown to need it. Within the rumen, cobalt is converted by microorganisms to vitamin B_{12}, which animals need for growth.

Where the plants fail to provide enough cobalt, other sources must be found. Soil applications of trace amounts of cobalt, grain supplements fortified with cobalt, and the injection of solid "bullets" of cobalt into the rumen have been used successfully.

Chocorua's Curse

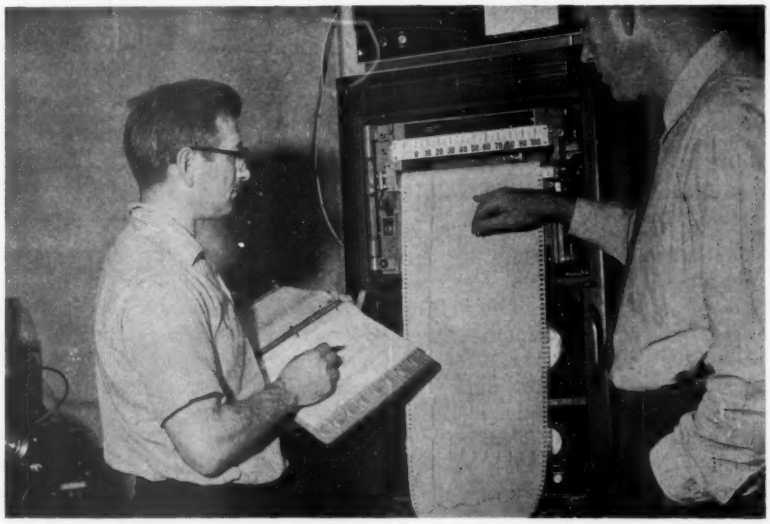
Cobalt deficiency was observed by the earliest settlers in parts of New England, but the cause of the disease was not recognized. In New Hampshire, it was called "Chocorua's Curse" and "Albany Ail" from local place names. In southern Massachusetts, it was known as "neck's ail," not because the disease affected the neck of the animal but because it was most common on necks of land that projected into the bays.

It is now known that cobalt deficiency in New England has its origin in the geologic history of the soils. The low-cobalt soils of New Hampshire, for example, are formed in glacial deposits derived from granite of the White Mountains, which contained very little cobalt.

Moreover, the Spodosols (Podzol soils) in the area, formed from sandy glacial drift, tend to lose their cobalt by leaching. Cobalt moves downward at a more rapid rate than iron, especially in Spodosols of poor drainage.

Cobalt deficiency among grazing animals also is a problem on wet sandy soils of the lower Coastal Plain in Southeastern United States. The low-cobalt soils there are Humaquods—poorly drained sandy soils with organic pans. The original sandy deposits had little cobalt to begin with and that was leached from the upper horizons as soil development proceeded. Consequently, there is little cobalt available to forage plants growing in these soils.

The X-ray emission spectrograph is used to analyze the mineral content of plant samples.



Grazing animals show cobalt deficiency symptoms when the amount of cobalt in the soil is less than 1 to 5 parts per million. This approximates 1 to 5 pounds of cobalt in an acre of surface soil 3 to 4 inches deep. The analytical job is even more difficult with plants in which the investigator must detect 1 part in 100 million.

Molybdenum toxicity

In contrast with cobalt, the problem of molybdenum toxicity arises from the fact that forage plants have a wide range of tolerance for that element, but animals do not. Large amounts have no apparent adverse effects upon plant growth but are toxic to grazing animals. Legumes accumulate more molybdenum than do the common grasses.

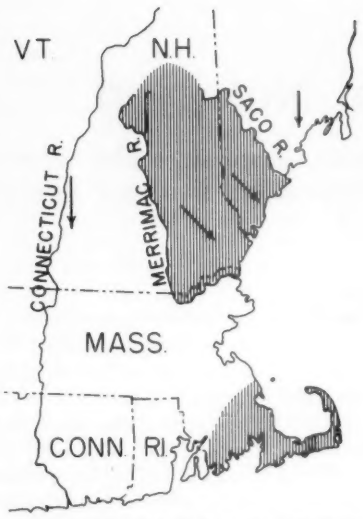
Molybdenum is essential for plant growth, but its role in animal nutrition remains to be determined. Because animals taking in too much molybdenum exhibit typical symptoms of copper deficiency, it appears that molybdenum limits the utilization of copper.

For practical purposes, animals can reasonably be expected to suffer if the molybdenum content of forage exceeds 10 to 20 parts per million. For reasons still unknown, grazed forage appears to be more toxic than hay with the same amount of molybdenum. In the United States the amount of molybdenum varies more among different species of plants than does copper.

Granite, shales, sandstones

Most of the problem areas of molybdenum toxicity in the Western States are related to the geologic origin and the wetness of the soils. The common sources of molybdenum are granite, shales, and fine-grained sandstones.

Critical areas of molybdenum toxicity commonly occur on wet flood plains, alluvial fans, and terraces of small streams built



Low-cobalt areas (shaded) in New England. The arrows indicate direction of glacial movement.

up mainly of these geologic materials. Such areas are rarely found along large rivers where the alluvium came from many sources. There material coming from rocks low in molybdenum effectively dilute large concentrations contributed by any single stream out of the molybdenum-rich rocks.

Granite of the Sierra Nevadas is the primary source of molybdenum in soils of California and Nevada where grazing animals suffer from molybdenum toxicity.

Poor soil drainage affects how much molybdenum a plant takes up. Legumes grown in wet soils take up more molybdenum than similar plants grown in well-drained soils having the same molybdenum content.

The spectrograph tells

The X-ray emission spectrograph is a valuable tool in detecting molybdenum in forage. Levels of molybdenum of the order of 4 or more parts per million can be determined directly in finely ground plant material. The determination of copper also is essential in the study of molybdenum-toxic forage, but the micronutrient must be determined by a chemical method.

It is possible to use forage plants high in molybdenum as animal feed. An effective treatment is direct injection of copper glycinate. An alternative is to harvest the forage and feed it as hay with the animals having ready access to salt with copper added. No soil treatment that could materially lower molybdenum content of forage is known.

The problems of cobalt deficiency and molybdenum toxicity in grazing animals are closely related to the origin and distribution of soils. Soil scientists, plant scientists, and veterinarians, therefore, are all involved in controlling the soil-plant-animal chain to assure healthy animals. ♦

White House Conference Scheduled This Month

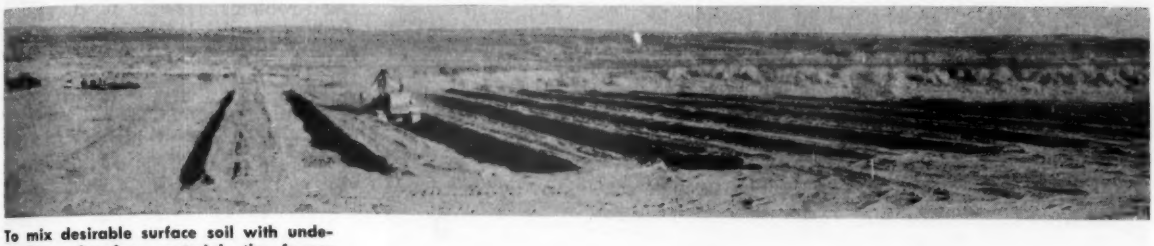
Twenty-eight national committees have been at work in 1965 during International Cooperation Year (ICY) to focus attention on cooperation instead of conflict in international affairs.

Their efforts will culminate in a White House Conference on International Cooperation, November 29 to December 1.

ICY has two main goals: (1) To publicize and review the public and private international cooperation that has been going on for two decades. (2) To plan new and better means of international cooperation in the future.

The idea of ICY was first proposed by the late Prime Minister Nehru of India in 1961 at the United Nations.

The committees are made up of both government representatives and private groups in many fields. USDA is represented on several. Mrs. Dorothy H. Jacobson, Assistant Secretary for International Affairs, is chairman of the Food and Agriculture Committee. ♦



To mix desirable surface soil with undesirable subsurface material, the farmer excavates strips the width of the scraper and levels the intervening strips.

Remaking the Soil

El Paso irrigation farmers swap or mix sand and clay to improve water use

By Hubert B. Jaco, *Soil Scientist, SCS, El Paso, Tex.*

"HOW deep is it to sand? Where can I find clay to mix with sandy soil?"

Irrigation farmers in the El Paso Valley of the Rio Grande in Texas get answers to these questions from SCS soil surveys to guide them in "swapping" soils.

Many irrigated fields in the El Paso-Hudspeth Soil Conservation District have been improved by mixing sand and clay. The farmers study their soil maps and understand the characteristics of the different kinds of soil before undertaking such a job. Otherwise, the results are likely to be disappointing, and may even be damaging to the land.

Soil surveys are also used to design the irrigation systems, particularly to determine the length of runs for water and the amount of water to apply.

For efficient irrigation

The need for soil-swapping arises from the fact that soils of different textures—sand, silt, loam, and clay—have different water-holding capacities, and different soils often occur in the same field.

To be irrigated efficiently, a field needs to be as uniform as possible in soil texture. In the El Paso area, efficient use of the limited water supply is important, and farmers do everything they can to achieve this goal.

For example, a field may be mainly of Gila soil with a silty clay loam surface layer and a loam subsoil. In the middle of the field there may be a narrow strip of 1 or 2 acres of Brazito soil with a fine sandy loam surface layer and a fine sand subsoil.

If the field is irrigated correctly to meet the needs of the Gila soil, plants growing on the Brazito area will wilt because water is not applied frequently enough. But, if the Brazito soil is irrigated correctly, the larger area of Gila soil will be irrigated too often with too little water.

In such a situation, many farmers search for an area of clay in another field the same size as the sandy soil area. The clay area usually has a poor stand of crops too, because of drowning or surface crusting. The soils are "swapped" by taking 5 to 10 inches from the surface of the sandy soil and trading it for 5 to 10 inches of clay soil from the other field. Then, by plowing and disking to mix the clay with the sand, a satisfactory soil texture for the whole

Large earthmoving equipment is called into play to reshape fields and modify soils in the El Paso irrigation district.

A front-end loader picks up "adobe" soil to be "swapped" for sand from another part of the field.

field is obtained.

Another problem in the valley is the presence of many old narrow river channels. These make fields that are inconvenient and expensive to farm. Many of these fields are underlain by a high water table causing a salt problem.

Farmers use soil maps to locate areas of good soil for use in filling the old river channels to the same level as the adjoining fields. This can require deep cuts in higher fields. A farmer uses the soil map to determine if he will find sand or other undesirable soil material in making deep cuts. If so, he cuts strips in the field the width of a scraper, leaving uncut strips of equal width. The uncut areas are then spread to fill the cuts.

Large areas of heavy soils that are high in lime and contain more than 50 percent clay are another problem. They form hard surface crusts that hinder emergence of seedlings. Spotty stands of cotton and alfalfa occur on these soils. Often they have to be replanted.

Many farmers use hoes, rakes, or pitchforks to scratch the surface to help cotton seedlings push through the crust. This is very expensive. A soil survey can be used to locate sandier layers that can be brought to the surface by deep plowing and mixed with the clay surface soil to form a less crusty plow layer.

Most farmers who deep-plow or "swap" soil own their own equipment and use their regular operators to run the machinery. They recognize that the practice must be carefully done and should not be done at all without good soils information. ♦

Conservation on School Grounds

HOUSTON County, Tenn., school officials recently gained firsthand knowledge of how a school expansion program can create problems in soil and water management.

Enlargement of classroom and playground areas at Erin and Tennessee Ridge Elementary Schools resulted in heavier water runoff from the school grounds during rainstorms.

Superintendent of Schools Billy G. Alsobrooks asked the Houston County Soil Conservation District for assistance. The Soil Conservation Service helped develop conservation plans for both school grounds.

At Erin Elementary, construction of an adequate and safe water disposal system was complicated by a steep hill behind the school. To overcome this and other drainage problems a series of diversion ditches and sod waterways was built.

At Tennessee Ridge Elementary, the main problem was disposing of surface accumulation during and after rains. This was provided for with a series of sod waterways.

Ball fields, diversion ditches, and sod waterways were limed and fertilized, then seeded with fescue grass and mulched with straw. Now the topsoil is held firmly in place by a dense sod.

"Almost as important as the conservation work, we wanted to impress on our children and the citizens of our county that good conservation practices can and must be a part of our lives," Superintendent Alsobrooks said. —JAMES L. BILYEU, *Work Unit Conservationist, SCS, Erin, Tenn.*

Supervisors Lead School Field Day

(Photo on back page)

SUPERVISORS of three soil and water conservation districts served as guides for some 350 sixth grade students on a conservation field day tour in Douglas County, Wash., last spring.

Federal, State, and county conservation specialists joined in providing instruction at the Badger Mountain ski area near Waterville under the direction of Bob Johnson, Douglas County Extension Agent. Supervisors of the Foster Creek, Douglas, and East Wenatchee districts, all in Douglas County, arranged the event and directed the groups of students.

Training in conservation of soil, water, and rangeland was conducted by SCS conservationists. At the soil station, students were shown soil profiles, told how soil is formed, and that food comes from a comparatively thin layer of topsoil.

Conservation practices dealing with water were explained at an-

other station.

Children were shown bluebunch wheatgrass and Idaho fescue plants at the range conservation station. These plants are important forage producers on native ranges in the Pacific Northwest. Students learned that overgrazing kills stands of native forage and allows less desirable plants to invade pastures.

The Washington State Game Department had installed a wildlife watering facility on the site, and the local game protector gave instruction in wildlife management.

A bright red truck filled with fire-fighting equipment was featured at the Washington State Department of Natural Resources' station where students were told that man starts 90 percent of all grass and forest fires.

The children learned to identify many of Washington's evergreen trees at the woodland station. The U. S. Forest Service supplied the instruction.

A conservation booklet prepared by the instructors helped the children prepare for the field day.

The conservation day was so successful, its sponsors hope to make it an annual event.—ERNEST A. BUSEK, *Work Unit Conservationist, SCS, Mansfield, Wash.* ♦

Recreation in Watershed Projects

Fifty-five recreational developments in 50 watershed projects in 25 States had been approved for cost-sharing assistance under Public Law 566 as of June 30, 1965. These developments involve added reservoir capacity, land, and such recreational facilities as docks and ramps, beaches, roads and trails, and picnic areas, and will cost about $18,592,000. Federal assistance amounts to $9,204,000, the local share $9,388,000. When completed, the projects will draw about 3 million recreation visits a year. ♦

The Hamerly Lutheran Church and cemetery lie in the protection of a windbreak that stills the drifting snow.

Dakota County Gets Early Start In Landscape Beautification

By William E. Purdy
Work Unit Conservationist, SCS, Mohall, N. Dak.

SHOULD the current crusade to beautify our American country side become a competitive race, Renville County, N. Dak., would quite probably be called back for jumping the gun.

Rural beautification and community betterment have been goals of this county's citizenry for several years now, thanks to the leadership of the Renville County Soil Conservation District and technical assistance from the Soil Conservation Service.

Cities, churches, and schools of the county, cooperating with the soil conservation district, have proved that conservation not only has a place on the farm but also plays an important role in community growth, beautification, and improvement.

The city of Mohall has been one of the leaders. Members of the Mohall Country Club planted a multiple-row windbreak on the west side of their golf course several years ago and later added other plantings around the clubhouse.

During 1964 the club prepared more ground and in 1965 planted a wildlife area and numerous single-row windbreaks along the fairways. The North Dakota Game and Fish Department, in the interest of wildlife habitat, furnished the trees and paid the Renville District for planting them.

Screen for dumpground

Mohall's dumpground, long an eyesore along the highway near the city, will soon be hidden from view by tree plantings as a result of a joint endeavor started 3 years ago by the city planning commission, the local FFA chapter, and the conservation district. The trees not only will screen the dump-

Trees being planted around Mohall, N. Dak., will provide protection from wind and snow and add beauty to the city.

ground, but also will serve as a snow fence to keep the approach road open.

Bob Wright, a soil conservation district cooperator, has planted windbreaks on the west side of town and can be given much credit for helping to keep snow out of the downtown area. The Mohall City Planning Commission also has one-row windbreaks across the north end and around the southeast part of town.

Not to be outdone, other towns have gotten into the act. Sherwood might not have a forest but it has a wildlife planting on the west side of town, established in 1963 through the cooperation of the State Game and Fish Department.

A multiple-row field windbreak along the west edge of Tolley also helps keep the snow out of that town and provides food and cover for wildlife.

Glenburn is planning a city park and using the SCS soil survey for guidance. The town is planning a wildlife habitat tree planting.

Mouse River Park plans

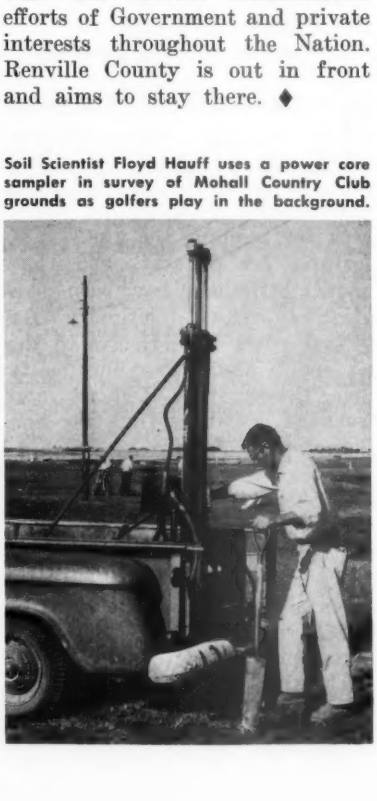
The Renville County Park Board, a cooperator with the soil conservation district, has asked for assistance in improving the Mouse River Park. SCS has furnished a soil survey and an enlarged aerial photo for long-range planning of this recreational area.

Many churches and schools also have planted protective tree belts. One of the nicer ones shields the Hamerly Lutheran Church and last winter kept snow out of the church yard and cemetery.

To encourage small plantings like these, the conservation district has furnished trees free to schools and churches. Many groups throughout the county have taken advantage of this offer to protect and beautify schools, cemeteries, and town halls.

The activities of the Renville County District are right in line with the current beautification efforts of Government and private interests throughout the Nation. Renville County is out in front and aims to stay there. ♦

Soil Scientist Floyd Hauff uses a power core sampler in survey of Mohall Country Club grounds as golfers play in the background.



Profit, Pleasure in Winter Wonderland

"WE really enjoy the winters," says Mrs. Ezra Thompson of Madison, Maine. "They are going too fast for us."

Mr. and Mrs. Thompson have a "winter wonderland" on their 523-acre Spring Brook Farm. They have turned what could have been a long, cold winter into happy hours.

The Thompsons bought two snowmobiles and are renting them to people for joy rides over cleared trails through the woods and fields on their land. Thompson said that these rides, about 12 miles long, are almost as scenic on a nice clear night as they are during the day.

The Thompsons became cooperators with Somerset County Soil and Water Conservation District in 1959. Their conservation plan was based on a dairy herd of 50 Guernsey milk cows with 20 replacements, all grass farming and no grazing.

In 1964 their plan was revised to include a recreation enterprise including the motor-sled trails, a gunnery range, tenting sites, and hunting cabins. They are now looking into the possibility of developing a 15-acre water impoundment for wildlife-recreation. — HOWARD L. BURPEE, *Work Unit Conservationist, SCS, Skowhegan, Maine.* ♦

Nearly one-third of the 18 million people over 65 in the U.S. live in rural areas. ♦

Now they're doing it over...

Pioneer Soil Scientist Watches County's Need for Survey Grow

By **Paul E. Davis,** *Soil Scientist, SCS, Trotwood, Ohio*

MONTGOMERY County, Ohio, is getting a new soil survey. Not many people remember the original survey, made back in 1900 when soil science was in its infancy.

One man remembers well, though: He's the one who did it.

Dr. George N. Coffey, now 90 and living near Wooster, made the survey along with the late Clarence W. Dorsey. It was the first in the State and one of the first in the country to be published.

A pioneer in the field of soil science, Dr. Coffey has greatly influenced the development of soil surveys in the United States.

In the 1900 survey, Dr. Coffey cataloged 5 kinds of soils in the county. The survey now under way already has classified 72 different kinds of soil. Increased knowledge and more intensive use of the land have led to more detailed mapping and classification of soils.

According to Dr. Coffey, the county has changed much since he and Mr. Dorsey surveyed it. The original publication supports his recollection. It reported that the average farm contained from 100 to 120 acres and that there were long stretches of native forest. Farms were selling at $60 to $100 an acre.

The scene is different today—the long stretches of native forest have given way to second growth timber in woodlots and on the steep slopes. Land values are up, the trend is to larger farms, and the investment in machinery alone is often more than the farmer of 1900 had invested in his entire operation.

There is increasing competition for the use of the land, too. The population of Montgomery County has grown from about 130,000 in 1900 to more than 527,000 today. Roads, housing developments, shopping centers, schools, parking lots, and playgrounds are spreading across the landscape.

It's no wonder, then, Dr. Coffey commented, that soil surveys today are of more use to more people than ever before. The 1900 survey was of use only in farming, he pointed out, while today's surveys also are used by homeowners, contractors, real estate developers, health departments, school boards, planning commissions and consultants, highway departments, and land appraisers.

For example, the Federal Land Bank and other financial institutions are using the available Montgomery County detailed soil maps to make land appraisals for farm loans. The Regional Transportation Board has used a general soil map of the county for planning purposes and anticipates using the detailed survey to even greater advantage.

Dr. George N. Coffey (l.), who surveyed Montgomery County in 1900, talks with the author, who is assisting in a modern detailed soil survey of the county.

Schools have used the soil survey in locating building sites and selecting suitable tree species for forestation programs.

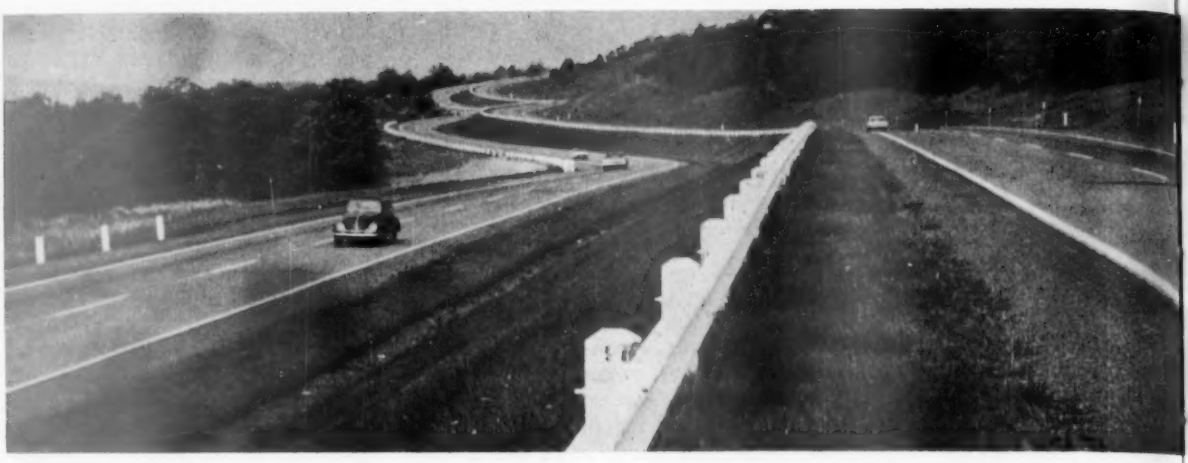
On the other hand, there are many instances of costly land use mistakes that could have been prevented had a detailed soil survey been available and used. For example, public funds are being required to correct flooding of basements in some parts of the Dayton area. The houses involved were built in wet areas that a soil survey would have indicated as poorly suited for home building or plat development.

Another example, familiar to residents of the county, is flooding of the Eldorado and Miami Villa plats. A soil survey map would have shown these plats as hazardous sites. The land could have been developed as recreational areas and parks.

It was such problems as these, as well as the realization that greater competition for land and a growing population called for more sound land use, that prompted the board of supervisors of the Montgomery Soil and Water Conservation District to request the Soil Conservation Service to make a modern soil survey of the county.

The new survey was begun in 1962. To date, soils have been studied and mapped over more than 165,000 acres of the county.

The field mapping part of the survey is scheduled for completion in 1968 and will provide much of the needed data for land use planning. In the meantime, much survey information is available to land users and land use planners. ♦



Key to beauty on the land...

Soil Survey Is Guide to Esthetics in Land Use

By Gerald W. Olson and Raymond L. Marshall
Soil Technologist, Department of Agronomy, Cornell University, Ithaca, N. Y., and State Soil Scientist, SCS, Syracuse, N. Y.

WISE use of the soil survey in land use planning and development can help to maintain and improve the beauty of the natural landscape.

Attention to soils information enables us to take advantage of the variations in soils that help make our surroundings excitingly different from one place to another rather than monotonous and drab.

The uniqueness and charm of individual places are due in large part to soil characteristics, such as relief, drainage, rockiness, texture, or factors of soil formation such as climate, vegetation, topography, geology, and time. Sometimes cities and towns are named for prominent soil characteristics in the area. Rocky (Okla.), Boulder (Colo.), Gravelly (Ark.), Sandy (Oreg.), Silt (Colo.), Clay (Ky.), Earth (Tex.), Black Earth (Wis.), and Red Bank (N.J.) are good examples.

Man can alter and substantially change his environment. Literally, mountains and hills can be moved by sheer power of earthmoving equipment. The results can either mar and detract from the scene or they can harmonize with and emphasize its pleasing features.

Highways for beauty

Highways are excellent examples of manmade features that can complement the landscape. Besides their utilitarian function as arteries of commerce, they can give esthetic satisfaction to the traveler when they enhance natural beauty. A highway that fits naturally into its surroundings gives the user the feeling that he is a part of and belongs to the land.

In New York State, highway planners use soil survey information in deciding locations and engineering features of highways. In addition, they can use soil surveys to help select locations that have beauty as well as utility.

Pipelines and powerlines also crisscross our landscape, often with detrimental effect. By using soil surveys, contractors can locate these important life-lines in suitable places and revegetate the disturbed areas in harmony with the landscape. By avoiding certain soils where corrosion of pipelines would be rapid, they can save considerable expense of maintenance.

Soil surveys can be used for almost every kind of development of land, because they describe the landscape so completely and in

A highway near Syracuse, N. Y., winds gracefully around the contour of the land to fit the natural landscape.

Machinery stands ready to reshape the earth to accommodate a population on the go. It will create a highway that has beauty as well as utility.

such great detail. Imaginative developers can extract a great deal of important information from soil maps.

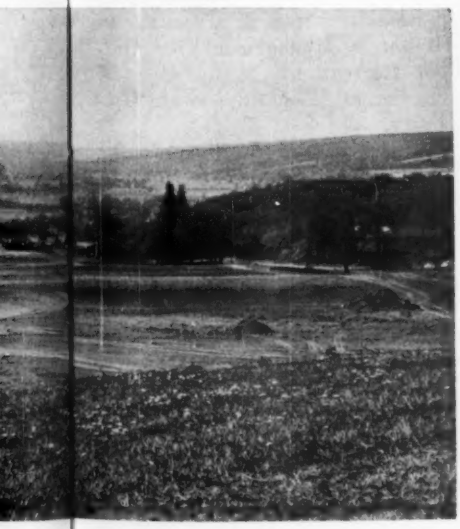
For example, the soil survey provides valuable information to the prospective developer of a ski hill. From a soil map on an aerial photo, location and direction of different slopes can be determined. Forest cover also is shown.

Interpretive maps can be made to show suitability of different areas for parking lots, building foundations, potable water supply, subsurface sewage disposal, hiking trails, bridle paths, landscaping, and other uses.

Soil surveys provide invaluable information to the developer interested in selecting a site for a rec-

Soil survey information was used to develop this ski area near Bristol, N. Y.

A golf course in a quiet valley near Moravia, N. Y., will blend into the surroundings and complement the beauty of the landscape.



The corrosive properties of different soils and their ease of revegetation are important in the location of pipelines.

reation development that includes year-round cottages, washrooms, bathhouses, picnic shelters, and service buildings. Major items affecting this use are wetness hazard, flooding hazard, slope, depth to hard bedrock, degree of stoniness and rockiness, and shrink-swell potential of the soil.

Septic tanks may also be needed for subsurface sewage disposal. Items affecting this use include soil permeability, ground-water level, depth to impervious layers, and kind of bedrock.

Finally, information in relation to hillside slippage, frost heaving, piping loose sand, and low bearing capacity of the soil when wet needs to be known. Such information is recorded in soil descriptions prepared during the soil survey. The descriptions can be used to rate soil limitations of the site and to prepare interpretive maps showing these differences. Some detailed onsite investigations are usually required for selection of a specific building site, but the soil survey can provide the preliminary information needed.

Early solutions

Careful land use planning with the soil survey will solve many little problems before they become big ones. For example, lakeshores that have been despoiled by pollution from unplanned developments will eventually have to be cleared and rebuilt in order to adequately serve future generations. But for lakeshores being developed now, the soil survey shows which sites are best for cabins, beaches, and sewage disposal. By building on the right kinds of soil the beach areas can be kept free of pollution, and the lake will remain beautiful and clean for future generations. Nearby areas, if carefully developed, will extend the esthetic value of the lake.

A golf course near Moravia, N. Y., is a good example. It will provide recreation for many people, and the esthetic landscape development will provide a beautiful scene with Lake Owasco in the background. Soil experts made onsite investigations of the site before construction started, enabling planners to locate areas shallow to bedrock and confine earthmoving to the deeper soils.

Encouraging the development of the wildlife resource adds to the esthetic quality and recreation opportunity of the countryside. The ease of establishment and development of particular kinds of habitat that produce and support specific kinds of wildlife can be rated by using the soil survey of the area. Important items in these ratings include the suitability of the soil for growing grain crops, its ability to hold water for ponds, and amount of natural cover.

Wise land development making full use of all resource inventories, including the soil survey, will assure that future generations enjoy surroundings of the highest esthetic quality the landscape can provide. This is soil conservation at its best. ♦

SCS Biologists in Recreation Seminar

Four SCS biologists will participate as lecturers in a seminar in "Resource Management for Outdoor Recreation" during the fall semester at Mississippi State University.

W. W. Neely, State biologist for South Carolina, will lecture on "Brackish Pond and Wetland Management;" Dr. Roy Grizell, Arkansas, on "Recreational Possibilities on Agricultural Lands and Waters;" and Edward Sullivan, Mississippi, and Olan Dillan, Regional Technical Service Center, Ft. Worth, Tex., on "Watershed Planning and Management." ♦

U. S. farmers use 5 million tons of steel a year, a third as much as the automotive industry. ♦

A dry hydrant by Paul Queneau's pond pumps a good stream of water during Cornish Fire Department School exercises.

"Dry" Fire Hydrants Protect Land And Homes in Rural New Hampshire

By E. Malcolm Strom
Assistant State Conservationist, SCS, Durham, N . H.

AN improved roadside "dry" hydrant is bringing better fire protection to rural residents in New Hampshire.

The idea of a dry hydrant is not new. It is hooked up to a pond, stream, or other rural water source rather than to a pressure-type municipal water system. But Floyd V. Barker, SCS work unit conservationist assisting the Strafford County Soil Conservation District, and SCS Engineer, Henry S. Stamatel developed a workable, inexpensive hydrant that is becoming increasingly popular with the fire departments and landowners throughout New England.

Fire chiefs like it

Almond "Red" Watson, chief of the Gilford, N. H., Fire Department, is one of its strongest supporters. "If the fire is near where a hydrant is installed it will easily save 10 to 15 minutes, and we figure this very often is the point where you save or lose a building," Watson said. He considers the hydrant "the cheapest insurance you can buy."

Verne Bucklin, captain of the Meredith Fire Department, credits the dry hydrant on the Marshall Hodson farm with saving his neighbor's buildings in a fire.

The Gilmanton Iron Works Fire Department raised the money to build a pond behind the fire house and installed a dry hydrant at the front door of the station. "Great protection for the village, and easy to refill our tank truck, too," said Fire Chief A. Richard Price.

Easy access

The hydrant makes many water sources in rural areas available to modern fire fighting equipment, particularly during the snow and mud seasons. Properly installed, a dry hydrant solves the access problem where costs of road construction and maintenance are high.

It works well in winter weather, too. Firemen at Walpole tried it one night at 10 degrees below zero and it worked perfectly.

Floyd V. Barker, SCS conservationist who developed the dry hydrant, checks height of the standpipe.

The hydrant consists of a vertical 3-foot length of 4-inch diameter black iron pipe threaded at both ends. A 4.5-inch, standard thread, steamer nozzle is attached to one end of the pipe with a 4-inch nipple and a 90-degree elbow. On the inlet end of the pipe a 4- to 6-inch reducer-adapter receives the 6-inch intake pipe.

What it is

When installed in the field, the hydrant is attached to a 6-inch bend. Standard lengths of pipe are connected to the bend and extended into the water source. A 16-inch diameter metal form set around the hydrant at ground level and filled with concrete protects the hydrant against accidents and frost. Gravel is used as fill around the hydrant to provide surface drainage.

To minimize freezing, installations are placed so that water in the inlet pipe will be at least 5 feet below ground level. The inlet pipe is located a minimum of 2 feet off the pond bottom.

The hydrant can deliver up to 500 gallons a minute.

District sells kits

Dry hydrant kits have been sold by the Strafford County District since 1960. The kits contain all materials needed for installation. The average dry hydrant costs approximately $200; the kits cost only $75.

Inquiries have come from fire departments, fire wardens, and insurance firms in 16 States and Canada. It appears the dry hydrant is no longer confined to northern New England. ♦

Water-Saving Siphon Replaces Irrigator's "Wooden Nightmare"

A SMALL group of Idaho farmers are resting more comfortably now since they replaced an old 230-foot wooden flume, called the "wooden nightmare," with a welded steel inverted siphon.

They not only rest more comfortably, but they have tripled their irrigation water flow and eliminated costly maintenance.

The old flume that carried irrigation water to four farmers across Spring Creek near Sterling rested on an unstable foundation and was supported by rotting timbers.

The four water users cooperated through the South Bingham Soil Conservation District to revise their irrigation systems and replace the siphon. Soil Conservation Service engineers made the necessary field surveys and designed a 275-foot inverted 23-inch welded steel siphon to carry 300 miner's inches (about 2,700 gallons per minute) of water—200 more than that carried by the old flume.

The increased flow now enables two of the farmers to irrigate at the same time. Before only one could irrigate and then with just a partial irrigating stream.

Cost of the project was shared by funds from the Agricultural Conservation Program.—WILFRED HASFURTHER, *Agronomy Specialist, SCS, Boise, Idaho.* ♦

Land Leveling Is Cure for Turnips

THERE was trouble in the turnip patch at Bush Brothers Farms in Greene County, Tenn.

Ponding water was ruining the turnip-green crop on a 100-acre field. The field, part of a 400-acre tract at the junction of Lick Creek and the Nolichucky River, lay on low terraces and had an uneven surface with hummocks and shallow depressions. This caused ponding after heavy rains or irrigation.

The wet soil prevented effective insect control and slowed harvesting operations, resulting in serious losses to the company.

S. B. Bush, president of the firm, applied to the Greene Soil Conservation District for help. SCS conservationists advised reshaping the land. The project involved moving about 50,000 cubic yards of earth at a total cost of about $9,000.

Other practices applied on the farm included stream channel improvement, grassed waterways, drainage field ditches and diversions, conservation cropping systems and cover crops, pasture and hayland planting, a sprinkler irrigation system, and tile drains.

The "trouble in the turnip patch" is now at an end for the Bush Brothers. They are getting much higher quality turnip greens and easier harvesting. The practice is catching on in other areas in eastern Tennessee. — CLARENCE RICHARDS, *Work Unit Conservationist, SCS, Greeneville, Tenn.* ♦

Hilltop Farm Shifts From Food to Fun

Drake's Hill Top Farm in Houlton, Maine, is starting its second century with a change from production of potatoes and beef to development of a recreation enterprise.

The farm, overlooking the town of Houlton, has been in the Drake family since 1854.

Increased demand for recreation by people in the Houlton area and increased need for camping sites by visitors encouraged Lyman Drake and his son-in-law, Eugene Bell, to convert the farm to a golf driving range and a camping and tenting area.

During 1963, Drake and Bell participated in the pilot Cropland Conversion Program. With technical help by the Soil Conservation Service, they built a pond for fee fishing and planted trees on areas not needed for recreational sites. —RANDOLPH H. WEST, *Work Unit Conservationist, SCS, Houlton, Maine.* ♦

Conservation Makes Good Cattle and Good Land

GOOD ranch management takes careful planning—and sound conservation grass management. A convincing example is the Katy Ranch, west of Barnard, S. Dak.

Humphrey Taylor has managed the ranch, owned by the Kelley Land and Cattle Company, for 12 years. He has carefully studied every aspect of his operations to find the figures—in pounds, percentages, dates, and inches—for most efficient operations. He is carrying out a range conservation plan as a cooperator with the Brown-Marshall Soil Conservation District.

The ranch has 3,000 acres of cultivated land and 1,960 acres of native rangeland. All cultivated land is seeded to a tame-grass mixture of alfalfa, smooth brome, and crested wheatgrass with a companion crop of oats.

The mixture is sown early in the spring, to take advantage of ample moisture to sprout the seed and start plants growing. Oats are sown first, using a drill behind a plow. Then the grass is planted with a special seeder that rolls the ground first, broadcasts the seed and packs the seed in afterwards.

To guard against erosion on the pasture slopes, Taylor has installed contour furrows laid out by the Soil Conservation Service to hold a 4-inch rain.

The cattle herd is moved to fresh pasture about every 10 days so the cattle are always on easy-to-get grass. They don't have to spend much effort—and calories—looking for forage.

Katy Ranch cowboys on one of the tame-grass pastures (from l.): Bill Spicer, Jerry Head, Edgar Head, and Terry Taylor.

Cattle are not put into a pasture unless the grass is at least 6 inches high. And they are taken off before the grass is pastured down closer than 3 inches, under the conservation cattleman's golden rule of "take half and leave half."

Watering facilities are located where the livestock can get water without traveling more than half a mile.

The Katy Ranch has broken the pasture season into three parts:

Spring (Apr. 1-May 1): Five hundred acres of native grass with draws and coulees for spring calving are used. Hay is spread on a different area of native pasture each day.

Summer (May 1-Sept. 1): Cattle are turned onto the eleven 160-acre tame pastures. They are moved from one pasture to another every 10 days, giving each pasture about 4 weeks' rest.

Fall (Sept. 1—Oct. 30): The livestock are put on 700 acres of native grass not used in the spring.

During November and December, a combination of hay and pasture is used. From 300 to 400 acres of tame grass is cut and rolled into bales. The bales are dropped from the baler without being tied, and cattle feed on them until the first of January.

The results of careful operations? "Our class II and III land in this 18- to 20-inch rainbelt makes a larger net return from well-managed grassland than it would from cultivated crops," Taylor says, "and it is one of the best means of protecting and improving soil and water resources."

—WALTER N. PARMETER, *Agronomist, SCS, Huron, S. Dak.* ♦

Cowboys round up cattle on an alfalfa-brome pasture on the Katy Ranch.

Groups Correct Water Damage

WHITE and Negro land owners and timber companies in Louisiana are working together in soil and water conservation districts to end water damage to their acreages.

One group in Allen Parish moved 100,000 cubic yards of earth to protect 2,100 acres of cropland, pasture, and woodland.

Prior to the work done through the Calcasieu Soil and Water Conservation District, floods had swept away standing rice crops at least once every 4 years. Only weeds that could stand the water grew in the pastures. Timberland produced only scrub hardwoods.

The Soil Conservation Service helped design and lay out a 5-mile long main ditch. Cooperators leveled their riceland for better use of water.

The Agricultural Stabilization and Conservation Service shared the cost of earthmoving. Other help came from the Parish Police Jury (county governing body), the district attorney, and the State Highway Department.

Today rice crops are safe. Fine pastures of good grasses and legumes have replaced the weeds. One lumber company is experimenting with pine seedlings on land where once only water-loving tupelo gum grew.

In northeast Louisiana, Cooperators William Shaw and J. J. Britton of the East Carroll-Madison Soil and Water Conservation District built a property-line lateral ditch between their farms. SCS Work Unit Conservationist W. B. "Shorty" Williams gave them guidance and technical help until the job was done. Today a fence doesn't separate their farms —a 1,200 foot ditch is the sign of their mutual interests.—JOHN M. CROSS, *Assistant to State Conservationist, SCS, Alexandria, La.* ♦

William Shaw (l.), J. J. Britton, and W. B. Williams, Jr., look at the ditch between the Shaw and Britton farms built with district-owned equipment.

Surveying Soils in Alaska

By Galen E. Kintner
Soil Scientist, SCS, Columbia, Mo.

EARLY in 1964, to step up soil classification in Alaska, the State conservationist selected eight soils men from the continental United States to make soil surveys in this rugged area.

I was one of those chosen to spend 4 months in the Susitna Valley in south central Alaska on this assignment.

Compared to most of the continental United States, surveying in this State differs in several ways: Living in tents, danger of wild animals, lots of mosquitoes, swift treacherous streams with few bridges, dense ground cover, few roads and trails—many of those impassable even with four-wheel drive trucks.

How to get there

We used many kinds of travel in addition to walking. Several streams that flow through the valley were used to good advantage. Operators who knew the swift streams were employed to haul us and our camping equipment in long, slim boats with powerful motors to locations as far as 15 miles upstream from the end of the road where we remained for a week at a time. I spent several weeks in these remote sections where our most obvious neighbors were bear, moose, and salmon. We made other trips in float and amphibious planes, muskeg tractors, and by the Alaska railroad, the only Government owned railroad in the United States.

Regardless of the mode of transportation, getting the camping gear, personal effects, and food to these remote areas was always a problem. After some experience, our party soon learned that a checklist was necessary if we were to have all of the essentials for the entire week—food being the most important. Experience taught us, too, that food had to be protected from bears.

Our day usually began with the clatter of pots and pans made by the early risers. After breakfast, each soils man and an assistant prepared for the day's work. The aide packed a knapsack with the essentials for a day's hike and checked his high powered rifle. The soils man plotted the proposed

route for the day on an aerial photograph and checked his compass and other equipment.

Photos don't tell

Even though aerial photographs are a great asset, all landscape features are not visible on them. Streams are clearly defined, but their depth and speed were problems to be solved when we arrived on the banks. Fallen trees, many times hidden in dense undergrowth, made walking difficult as well as dangerous. As we walked through this wild, wooded terrain, we checked the kind of soil, lay of the land, and other land features, and recorded the information on the photographs.

These maps provide valuable information to prospective buyers, homesteaders, road contractors, and to people interested in future cities, airports, recreational areas, and many other uses. Because it is so difficult to get to these remote areas, soil surveys in Alaska can save people many difficult days' work in learning about the country.

A 3- or 4-mile hike usually found the sun directly in the south. Relaxing on the banks of a stream or sitting on a log completely surrounded by nature, made one forget about the difficulties of the morning's work, we discovered. If the bank of a stream was chosen as a lunch stop, fish were probably the topic of conversation. We wondered why the salmon battle the rapids and swift current just to spawn and die, and how they can find the same stream in which they were hatched after 3 or 4 years at sea? Bear tracks in the sand and partially eaten fish proved some salmon met an unforeseen destiny.

Lakeside snack

The shores of beautiful lakes made the noon snack an enjoyable experience. Moose were often seen feeding along the shores and some times swimming across the lake. Occasionally a black bear would be seen eating berries or digging for ants in an old log.

By 5 or 6 o'clock with the sun still high in the sky, most of us found our way back to camp. Sometimes we met with more rugged terrain than we anticipated, or we failed to take enough compass readings. This meant "cold beans" for us.

After a discussion of the kinds of soil that we had found and a swapping of other interesting experiences, we ended the day with some form of recreation—cards, reading, or fishing.

As the adventures in the "land of the midnight sun" become only memories, hardships lose their edge, and a warm feeling remains for most of us—the quiet solitude and the unspoiled wildness that are Alaska. ♦

Recreation

(*Continued from page 76*)

appraisal will be a statement telling how much of each kind of recreation area *could* be developed in the district if warranted. The manner of stating the potential may vary according to the kind of recreation being considered and the specificity of the data.

Projecting demand

The third stage of program planning for outdoor recreation is an analysis of present and probable future needs for additional facilities. This is a market analysis and involves economic and social considerations. These needs are the portion of the undeveloped potential that should be developed in the near future to satisfy demand. For purposes of soil conservation district planning, a 5-year projection may be adequate. However most of the nationwide predictions of future needs have projected to 1980 or thereabouts. Districts may wish to follow this course and then estimate the rate of development of needs over the 15-year period.

Recreation needs reflect the interests and desires of people. Predictions of future needs will begin with present demand, increase it for population growth, adjust that for changes in character of the population (such as age groups, occupations, income level, etc.), and adjust it further for any discernable changes in use of time for recreation and tastes in types of recreation.

Two kinds of statistics are available which give nationwide information useful in making predictions of recreation needs. The ORRRC report estimated the increase in outdoor recreation activity from 1960 to 1976. The rate of increase should be roughly comparable from 1965 to 1980, and local districts could use the same percentages in their estimates. Thus, swimming might be expected to increase by 75 percent, picnicking by 50 percent, boating by 90 percent, camping by 88 percent, etc.

Trade associations and others have estimated needs for various recreation facilities for certain activities or areas by ratios of the population, such as: One 18-hole golf course per 25,000 people; swimming capacity to take care of 3 percent of the population at one time; 1 acre of public park for every 75 people in towns of 5,000-8,000; and the like.

Such general data may be adjusted for local use by exercising group judgment in comparing the local district with the "average" situation. The elements previously analyzed in appraising resource potential will be useful in developing these judgments.

Trends are clue

Information on trends in recreation participation may be obtained locally by using both statistical records and informed judgment. Operators of representative private and public recreation areas can supply informa-

tion. Those that have been in operation several years can describe trends they have observed. New areas may indicate changes in recreation desires of people.

Present desires of people for recreation can be estimated by group judgment of well-informed people. Park officials, chambers of commerce, secretaries, wildlife agency experts, soil conservationists, foresters, county agricultural agents, recreation trade association officers, sporting goods dealers, historians, resort and motel operators, and others can be helpful in arriving at sound estimates of local recreation interests.

A more precise method of determining peoples' habits and intentions in outdoor recreation is the interview survey, if based on a sound, scientific sampling of opinion by personal interview or mail questionnaire. It has two phases: (1) A survey of users of existing recreation facilities taken by interview at the recreation areas; and (2) a survey of the general population taken at homes, either by direct interview or by mail.

For certain kinds of recreation, local trends give adequate information; for others, State and regional trends are needed. For example, local information is all that is needed for field sports areas. But sound plans for developing vacation farms or guest ranches require information about trends over a wider area because of the greater distance people will travel to use them. Thus, adjacent soil conservation districts can profitably exchange information, and they may need some data from the State recreation planning agency.

With the information on present and future demand summarized, the next step is to relate it to the data on existing areas and potentials for development. For each kind of enterprise, the questions are: (1) How much will demand exceed the present supply, and (2) how much of this unfilled need do we have resources to provide? Expressed another way, what parts of our undeveloped and underdeveloped resources should be developed for outdoor recreation in the years ahead?

Another important question is: What parts of these unfulfilled needs should be met by the acquisition of new publicly owned recreation areas and what parts met through private enterprise?

The answer to these are essential to program development and policy guidance by those concerned with the development of outdoor recreation locally. They are of interest to soil conservation districts, county and municipal governments, and to local and State agencies having responsibilities for outdoor recreation.

The inventories and surveys involved may be handled in many ways with various of the concerned groups participating. Soil conservation districts are particularly suited to providing leadership in handling the inventories since they directly involve land and water resources. They have a great opportunity to be of public service by sponsoring and participating in these recreation inventories and their uses. ♦

Early Cooperator Still an Avid Fan

THEY'RE 22 years old, but John Buente still likes his terraces. "They'll stay there as long as I live," he says.

Buente, 1964 Farmer of the Year in the Vanderburgh County Soil and Water Conservation District, Ind., was one of the first cooperators in the first district organized in Indiana.

In 1943, Chairman of the new district, Christ Buente, a cousin of John Buente, talked John into letting the Civilian Conservation Corps install terraces and other practices that SCS had recommended on his 160-acre grain and hog farm near Evansville.

What's the secret to successful conservation farming? John Buente says, "First off, you've got to figure out what practices you need on your farm. Then build what you need, and after you have everything built, keep it up."

His award indicates he is doing an excellent job of "keeping it up."—MILTON E. SPENCE, *Work Unit Conservationist, SCS, Evansville, Ind.* ♦

John Buente topdresses a wheat crop with nitrogen along his 22-year-old terrace system.

CONSERVATION PROFILE

Ben H. Feldewert

Missouri

Landslide starts farmer on conservation career

MOST Americans recall election day in 1936 as the biggest landslide in United States presidential history. But Ben H. Feldewert, St. Charles County, Mo., farmer and conservationist, remembers the day for yet another reason.

Feldewert recalls that Franklin Roosevelt's sweeping victory at the polls wasn't the only landslide that November 2. He saw the land slide right out of his fields under a torrential rainstorm.

"It really ditched my farm," Feldewert said. "The next spring we had to go in with a 2-horse plow to fill the ditches before we could harvest the wheat. That's when I started terracing."

Feldewert has been promoting conservation ever since. Besides being one of the county's first landowners to build terraces, waterways, and ponds, he was instrumental in organizing the St. Charles County Soil and Water Conservation District in 1944. He has been chairman of its board of supervisors ever since.

Feldewert later helped organize the Missouri Association of Soil and Water Conservation Districts. He also was in charge of a statewide conservation field day in St. Charles County in 1954. Just 11 years later the site for the field day is completely taken up in the urban development around St. Louis.

"Mr. Feldewert and his district have done a tremendous job in adjusting their conservation program to meet new problems as farmland is incorporated into suburbs," says Howard Jackson, SCS State conservationist for Missouri.

Realizing that city people could understand the farmer's conservation problem better if they knew more about it, Feldewert and his fellow supervisors were instrumental in organizing several programs aimed at conservation education and closer farm-city relationships. A conservation poster and scrapbook contest started in 1952 has helped thousands of St. Charles County seventh and eighth graders learn about conservation.

Feldewert was also prominent in inaugurating the first fish-for-fun contest in Missouri. Each spring the conservation district asks landowners to open their ponds to public fishing for two consecutive weekends. The program gives city people a day on the farm to relax and see conservation practices at work. It usually draws 800 to 900 fishermen, including women and children, many from nearby St. Louis.

Through Feldewert's leadership, the St. Charles District was first in Missouri to sponsor an annual meeting. The supervisors also publish the *Reporter,* a bimonthly newsletter. It won second place among new newsletters in the annual contest of the National Association of Soil and Water Conservation Districts last year.

In addition to his outstanding work in conservation, Feldewert has helped with many other activities. He has served as president of the O'Fallon school board and is now in his 16th year as a member of that board. He also serves as president of the 6-man St. Charles County school board, helps classify young men and review deferment applications for the local draft board and has served as chairman of the Federal Land Bank Association and as a member of the fair grounds board.

This Missouri conservationist has been recognized by many groups. *Life* magazine featured him and his conservation accomplishments in a World War II issue. In 1947, he won the Skelly Award, a statewide honor. In 1950, he was honored for his outstanding contributions to conservation at a National Soil Conservation Field Day in Zearing, Iowa. The *St. Louis Globe Democrat* also honored him that year for his conservation achievements. In 1962, his conservation district won the Goodyear Award, and he and another cooperator, Bernard Dyer, were selected to make the 4-day expense-paid trip to Litchfield, Ariz. He also received the Long Stride, Golden Step Award from the St. Louis Chamber of Commerce in 1962.

Feldewert was born July 25, 1893, on a farm in the same area where he still lives. He and his wife, Louise, are proud of their plantation home which was built in 1837, complete with pillars like Mt. Vernon. They have three children, John, who works with Ozark Airlines at St. Louis Municipal Airport; and Jeanette and Rosa Lee, who work at St. Joseph's Hospital in St. Charles. ♦

Consumers All: The Yearbook of Agriculture, 1965. *USDA. 496 pp., illus. $2.75.*

The 1965 Yearbook of Agriculture is a book of facts and basic principles needed by all citizens to make intelligent decisions about housing, home furnishing and equipment, finances, safety, health, food, clothing, and recreation.

Written for the "average" consumer, the book's 128 chapters contain very few technical terms and average less than 3,500 words in length. Yet, even the reader with some competence in a particular area will find valuable how-to-do-it tips in *Consumers All.* Excellent line drawings are used effectively to illustrate specific points in several chapters. It is a practical reference that could well be used daily in every American home.

The topics range from basic information on how to cook all types of meat to methods of sewing buttons on wearing apparel and from points to consider in planning personal and family finances to recreational-vocational opportunities in the study of nature. The contents generally were derived from bulletins and pamphlets published or in the process of publication by USDA.

The Soil Conservation Service contributed two articles: "Country Vacations," by Lloyd Partain, Assistant to the Administrator on Recreation, and "Nature Study," by Adrian C. Fox, Information Division, and Lawrence V. Compton, head biologist.

The 1965 Yearbook underscores the theme that the work of the Department, though primarily centered on services to farmers and ranchers, directly benefits all consumers. As Secretary Freeman points out in the foreword, $2 of every $3 of USDA expenditures "are spent for services of primary benefit to all of us as consumers." In this light, it seems especially appropriate that USDA publish such a complete and handy reference designed for use by all citizens.—WALTER E. JESKE.

Organization and Methodology for River Basin Planning. EDITED BY C. E. KINDSVATER. 1964. *Water Resources Center, Georgia Institute of Technology, Atlanta. 561 pp., illus., maps, charts. $5.*

This book presents the proceedings of a 3-day seminar based on the study and report of the U. S. Study Commission, Southeast River Basins, held in November 1963 at the Water Resources Center of Georgia Institute of Technology.

More than 60 participants from colleges and universities, business, congressional committee staffs, foundations, State and Federal agencies, and members and staff of the U. S. Study Commission presented their various reactions to and appraisals of the recently completed study.

Some found much that was good in the study as conducted. Others placed emphasis on improvements that could be made should other studies be undertaken.

The frank reactions by informed and experienced people from many disciplines and with widely varied backgrounds make the book interesting to any one concerned with river basin planning. Although they don't sum up to a specific answer, they provide grist from which the reader can form his own conclusions.—GEORGE R. PHILLIPS, *Special Assistant to Deputy Administrator for Watersheds.*

Forest-Soil Relationships in North America. EDITED BY CHESTER T. YOUNGBERG. *1965. Oregon State Univ. Press, Corvallis. 532 pp., illus. $8.*

This book contains the papers presented at the Second North American Forest Soils Conference held at Oregon State University in August 1963. It includes 35 papers by many authors, mostly from the United States and Canada. Subjects include: Detailed research of many kinds; methods of making soil surveys, soil-vegetation surveys, and classifications of forested lands; presentation of soil-woodland interpretations and examples of how soil interpretations are used in multiple-use management; and summaries of progress and procedures by industry and agencies dealing with soil surveys and their uses. Those interested in forest-soil relationships will want to consult this valuable addition to the literature.—PAUL E. LEMMON, *Soil-Woodland Specialist, SCS, Washington, D. C.*

New Publications

Water and the Land. BY BEN OSBORN AND PHOEBE O' N. HARRISON. *1965. USDA SCS-TP-147. 16 pp., illus.*

Nearly everywhere there's a water problem—too little or too much, too soon or too late. But each is a local problem, understandable only against the background of local resources, economic development, and needs.

Updating the figures in and superceding SCS-TP-134, this publication summarizes the water problem and the water supply, use of water by plants and water for human use, sources of water, water-losses and water rights, and problems of too much water, and cites literature on the subject.

Soil Surveys

Waseca County, Minnesota. BY JOSEPH F. CUMMINS. *1965. 84 pp., illus.; maps 4 inches to the mile (1:15,840).* Field survey by Carroll R. Carlson, Joseph F. Cummins, Russell J. Edwards, Grenfall F. Harms, Gordon Macvey, D. Kirk Woodworth, Halvor Ravenholt, and Leo G. Shields.

Jefferson County, Texas. BY JACK D. CROUT, DOUGLAS G. SYMMANK, AND GLENN A. PETERSON. *1965. 73 pp., illus.; maps 3.17 inches to the mile (1:20,000).* ♦

From the Administrator:

International Cooperation

RESOURCE conservation and development is an important part of current worldwide efforts to improve the living conditions of peoples in all nations through international cooperation.

The Soil Conservation Service and the Department of Agriculture are involved in the work of several of the 28 committees carrying forward a program marking 1965 as International Cooperation Year.

Our concern for survival in this nuclear age naturally gives top priority to peacemaking and disarmament efforts. Our Government's policy of supporting the United Nations and its specialized agencies is well known.

Not so well known are our technical and economic activities, but it is in these fields that most international agreements are achieved. The extent of United States cooperation with other countries is indicated by the fact that our Government takes part in some 80 international organizations and programs and is a signatory to nearly 4,300 treaties and agreements now in force. About three-fourths of these were signed in the past 25 years.

Almost from the beginning of its existence, the Soil Conservation Service has actively assisted other nations in resource conservation by training specialists and students who come here to learn our methods and by providing professional people for foreign service when requested directly by governments or private companies or through the Food and Agriculture Organization of the United Nations and the Agency of International Development (or its predecessors).

The Soil Conservation Service has increased its activity in other lands notably in recent years. In addition to providing people for foreign assignments with other organizations, today we have soil conservationists, soil scientists, engineers, plant materials specialists, and other professionals serving directly in eight countries outside the United States.

Our main endeavor in these countries is directed to training local people in techniques of soil and water conservation that will benefit their agricultural programs. We hope that they in turn will be able to train their own people to carry out sound conservation measures.

My own experience in India, Turkey, and most recently in Costa Rica and El Salvador leads me to point out some of the problems that face our professional people overseas.

Most of the developing countries are hampered by severe economic problems, low levels of literacy, and often by long-established customs that run counter to good land use. The land occupiers generally cannot afford to own expensive modern equipment, so the work must be done with crude implements and handtools.

These conditions present a formidable challenge to technical people accustomed to working with the latest developments in agricultural technology. In their foreign assignments, they must adjust rapidly to local conditions and find simple ways of doing things needed to conserve soil and water and increase the productivity of land resources. Improvements come slowly, but any increase in yield and quality of agricultural products help raise the standard of living of the individual and the nation.

Agriculture in any land cannot be sound without proper attention to the basic natural resources on which production depends. The Soil Conservation Service, and other agencies of the Department, are making a real contribution to world peace by helping other nations secure the foundations of their economic well being.

The job requires the efforts of the most capable and most dedicated people we have. A foreign assignment is not to be regarded as an opportunity for an extended vacation or gradual retirement.

Fortunately, our current arrangements with AID offer opportunities for energetic and ambitious conservationists of many specialties to sharpen their talents in foreign lands and make their contributions to international development without sacrifice of security or status in the Soil Conservation Service. In fact, such experience is a good way for employees to hasten their professional advancement in the Service.

The character of conservation work in the United States has changed a great deal in the past decade, with increasing attention to recreational and esthetic values of land rather than to commodity production. These are challenging concerns, but the results are largely intangible and often difficult to assess.

Our conservation missions in foreign lands bring our people face to face with the elemental necessities of survival and direct dependence on the land. They offer the same challenge to the pioneering spirit that we more frequently experienced in the early days of the conservation movement in America.

We are proud to be making our contribution to international cooperation in such a fundamental way.

D. A. WILLIAMS

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On-the-Ground Instruction in Conservation

Story on page 80

Sixth grade students in Douglas County, Wash., got on-the-ground instruction in conservation of soil, range, woodland, and wildlife on a conservation field day tour led by supervisors from three conservation districts. Above, Al Young, SCS range specialist, explains how overgrazing depletes native bunch grasses. The children also learned to identify several important range grasses.

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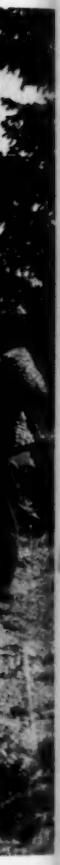

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